PMNorthAnna3COLPEmails Resource

From: Christopher Cook
Sent: Wednesday, May 21, 2008 6:35 PM
To: Andrea Johnson; Thomas Kevern
Subject: North Anna Hydrology Safety Audit Trip Report
Attachments: NA_Hydrology_SafetyAudit_TripReport.pdf; FW: Conference Details (MAY 22, 2008--04:30 PM ET--Conf# 4914123)

Andrea and Tom,
Attached is the trip report for the North Anna Safety Site Audit on April 10, 2008. The report details all attendees (pg 3) as well as a narrative describing our discussions over the two days.

At the end of the first and second paragraphs are two commitments that we recorded:
1) Dominion agrees to submit HEC-RAS input files
2) Dominion agrees to submit MODFLOW input files

Tony Banks just called me to see if we can discuss these two items tomorrow during a 4:30 PM phone call Alicia is setting up (see attached). I said that it was OK with me, but I should have placed a caveat on the response - so long as you two are OK with that discussion taking place. Perhaps you would can sit in as well? Please let me know how you'd like to proceed.

Regards,
Chris

Hearing Identifier: NorthAnna3_Public_EX
Email Number: 82

Mail Envelope Properties (3AF7DEF82ADA8944AD8247B7ED7FD651448D06B4F2)

Subject: North Anna Hydrology Safety Audit Trip Report
Sent Date: 5/21/2008 6:34:40 PM
Received Date: 5/21/2008 6:34:42 PM
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Files	**Size**	**Date & Time**
MESSAGE	819	5/21/2008 6:34:42 PM
NA_Hydrology_SafetyAudit_TripReport.pdf	73187	
FW: Conference Details (MAY 22, 2008--04:30 PM ET--Conf# 4914123)	18757	

Options
Priority: Standard
Return Notification: No
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Sensitivity: Normal
Expiration Date:
Recipients Received:

Applicant analyses of the effects of local intense precipitation (FSAR 2.4.2.3) were discussed. Planned post-construction site elevations and surface drainage pathways, including large-scale drawings, were presented. The results of a HEC-RAS model application to compute local-scale drainage for a design storm were discussed. It was agreed that the HEC-RAS input files would be made available to the NRC.

Groundwater analyses conducted for preparation of FSAR 2.4.12 and 2.4.13 were discussed. Angelos Findikakis (Bechtel) presented the MOFLOW groundwater modeling completed to support the determination of post-construction subsurface hydraulic loading (FSAR 2.4.12.4). This presentation was made from a calculation documentation that provided many details about the development and calibration of the numerical groundwater flow model that were not included in the FSAR. A steady-state, two-layer (the lower layer representing the saprolite) model was developed. Recharge and saturated hydraulic conductivity were adjusted to fit observed groundwater heads. Two saturated hydraulic conductivity zones were used (in plan view) with the demarcation between zones defined by the location of an identified fault. Many questions were raised during this presentation on April 10th that were subsequently addressed in a follow-up presentation on April 11th after some additional efforts were put into the presentation materials. Significant issues raised with the applicant were the interpretation of groundwater head in well OW-901 located at the position of the proposed reactor. Head in this well was poorly matched in the groundwater model calibration. Applicant suggested that the relatively high head in OW-901 was the result of the well being located at a topographic high point. It was noted that this well was screened at a depth significantly deeper than the nearby wells OW-845 and -846, at which heads were consistently more than 10 feet lower. To address the importance of well OW-901, an alternative calibration that favored fitting the head at that location was also completed. This alternative resulted in generally over-estimating heads at other wells. Predictive simulations of post-construction heads conducted using the results of the two calibrations showed that maximum groundwater head would be more than two feet below the design elevation. It was agreed that the MODFLOW input files would be made available to the NRC.

Stewart Taylor (Bechtel) presented the groundwater transport analysis completed for FSAR 2.4.13. Applicant asserted that the reactor design includes mitigating features to prevent radionuclide releases, but they decided to complete the 2.4.13 transport analysis anyway (to be consistent with the SRP). The transport analysis included the effect of adsorption; values for adsorption coefficients were chosen as the 10th percentile from distributions given in NUREG/CR-6697. To confirm the appropriateness of these values, site-specific adsorption data was obtained using site soil and rock samples and groundwater from the site. A report documenting the laboratory measurements of adsorption coefficient (K_d) for the transport analysis was provided for review. Measurements were conducted on the less than 2 mm size fraction of samples (the fraction > 2 mm was zero for most of the samples). Laboratory analyses were conducted by Dan Kaplan at Savannah River National Lab. In some cases, there were site-specific

values of K_d that were less than the literature-derived values used in the transport analysis. It was suggested that, for a conservative analysis, it might be better to use the minimum observed K_d in those cases where it was less than the literature-derived value. It was also noted that a wide range of pH values was measured in the soil samples used in the lab K_d measurements and that there was an apparent relationship between the measured K_d values and the measured pH values. It was suggested that the implications of this for the conservativeness of the transport analysis should be considered. The applicant was asked whether chelating agents would be present in the waste used in the FSAR 2.4.13 analysis source term. (They would be checking into this.) Since the FSAR 2.4.13 analysis was independent of (and used different models than) the groundwater flow modeling of FSAR 2.4.12, the applicant was asked to compare the two analyses in terms of groundwater velocities and transport pathways. Results were presented to demonstrate the conservativeness of the FSAR 2.4.13 transport analysis vis-à-vis the FSAR 2.4.12 groundwater flow analysis. Pore velocities for the FSAR 2.4.12 flow analysis were 0.11 ft/day to 0.27 ft/day along the transport pathway, while the pore velocity used in FSAR 2.4.13 was 0.54 ft/day.

North Anna Unit 3 COLA
Hydrology Safety Audit - Frederick, MD
April 10, 2008

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